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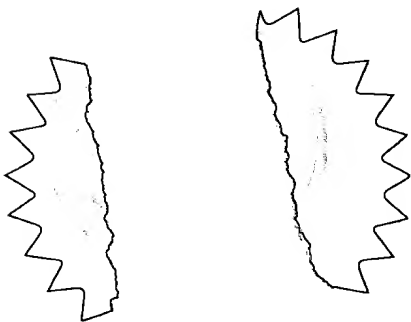
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בקשה לפטנט

Application for Patent

לשימוש הלשכה

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בעל המצאה מכח הדין

ששמה הוא:

Owner, by virtue of the Law

of an invention, the title of which is:

אוטם למערכות שתיה

(בעברית)

(Hebrew)

Sealer For Hydration Systems

(באנגלית)

(English)

הממציא/ים: יורם גיל, חורב 71 א', חיפה, ישראל

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Hereby apply for a patent to be granted to me in respect thereof

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SEALER FOR HYDRATION SYSTEMS

SEALER FOR HYDRATION SYSTEMS

5 FILED OF THE INVENTION

The present invention relates to personal hydration containers. More particularly, the present invention relates to a sealer adapted to close an opening in personal hydration containers.

10

BACKGROUND OF THE INVENTION

Personal hydration systems are known in the art and are used extensively by people that are active in sports, in trekking activities, in recreation activities as well as in the military. Over the last decade, people in general and especially people that are active in physical activities became aware of the fact that drinking during physical activity is crucial from health considerations. Therefore, personal hydration systems were developed over the years and since the use of soft polymers such as polyurethane became applicable in designing the drinking containers of the hydration systems, flexible containers, bladder-like containers, became widely used. An example for a personal hydration system is shown in US 5,816,457 "hydration system" by Croft, filed in 1996. This patented hydration system for backpackers or other athletes includes a bladder, a filling opening, an enclosing cover and filling opening, a flexible line and a deformable valve to be held in the user's mouth. Another hydration system was invented by the inventors of the present invention (Gill Yoram and Ezer Asaf) and disclosed in PCT patent application no. PCT/IL97/00263 (filed in the US as 09/297,384) "Flexible Container for Storing and Dispensing Liquids". This flexible container comprises an inner bag and at least one outer bag, and liquid dispensing means.

One of the problems stemming from the use of flexible polymers in the design of hydration containers is that they are not easily cleaned. The soft polymer itself is a material that may absorb matter from the liquid, especially if

the liquid filled in the container is juice or tea or other sugar containing liquid. In addition, the container is soft and has fused areas, therefore residues of the liquid that was inside the container may be left in corners formed in the sides of the container. Cleaning becomes a problem even when using the opening
 5 of the container from which the container is filled by liquid since this opening is usually relatively small. Accessories for cleaning flexible containers are available (can be purchased in the markets) but still, the maintenance of the container is difficult.

Most of the flexible containers are made from two flexible sheets of
 10 polymer fused together from all sides while an opening for filling the container and drinking from it is formed on the side of the container in the surface of one of the sheets. One of the solutions for the maintenance problem in those types of flexible containers is to leave a large opening on one of the sides of the container by leaving an unfused area. It is straightforward that the unfused
 15 area that acts as an opening is in the narrower side of the container while it becomes very easy to clean the interior of the container by inserting a hand into it. Moreover, it is easy to dry the container after cleaning is finished and there is no need for expensive cleaning and drying accessories.

Leaving an unfused area to be used as an opening for cleaning the
 20 container brought about another problem. The ability to hermetically seal this opening when the container is in use and filled with liquid is diminished. Several solutions are available on the markets. Two of the solutions ("easy clean" from Blackburn company and another container from ultimate direction company) are based on an extended opening that may be folded several
 25 times and possibly to different directions. The folds of "easy clean" may be secured by valkro. The solution of ultimate direction is based on US patent no. 5,941,640 "Roll Top Bladder" by Thatcher filed in 1997. This bladder includes two sidewall portions, which are disposed opposite one another and joined along a majority of the perimeter. In the unattached portion, a neck is formed,
 30 which extends from the body of the bladder. To close the conduit formed by the neck portion, the neck portion is rolled towards the body. The rolled neck portion seals the opening closed and prevents liquid from escaping out of the neck. Another solution is offered by cascade designs company. Here, their platypus flexible hydration system is closed by a "big zip". The closure is

based on the idea of a plastic zipper in which one side of the opening is provided with a strip that protrudes from the sheet surface and opposite to the strip, a corresponding groove is provided. When the user wishes to close the container, he presses the strip into the groove so that the opening is closed.

5 Another solution that is based on the idea of a ZIP-LOCK® is disclosed in US patent no. 5,913,456 by Dileman "Pressurized Portable Drinking System" filed in 1997. This patent discloses a liquid dispenser that includes a container formed of a flexible synthetic resin material and a hose connected to the container for dispensing liquid. Among other features, the dispenser also
10 includes a closure assembly that is positionable in a sealed position sealing a cavity shut beneath a mouth so that the cavity is substantially liquid tight, and an unsealed position exposing the cavity to the mouth for filling.

In all the available solutions including the above mentioned ones, the container is prone to liquid leakage. In all of these cases, the container has to
15 be positioned so that the opening is in the upper side of the container at all times. This fact prevents the free use of the container to many of the application that these containers are designed for. For example, when the personal hydration system is placed on the rear of a bike, it is most convenient to put the container on its side. Placing a container having a
20 cleaning opening closed in the way described herein above cause leakage and loses of liquid. Those containers may be used only when the container is hanged, a fact that limits the use of the personal hydration system. There is a need to provide an easy way to close the hydration container so that the container is completely sealed when in use. Moreover, when the container is
25 safely sealed, it may be placed in any orientation without leakage. Another problem that originates from using a zip-like closure is that when the container is filled, the user has to squeeze the side edges of the container in order to open up the opening. This operation is uncomfortable.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a sealer that hermetically closes an opening in a flexible container that is used for personal hydration systems.

It is yet another object of the present invention to provide a sealer that safely secures and closes an opening in a flexible container so that liquid from the container would not leak even when the container is full and even if the container is positioned with the opening in its bottom.

Yet, it is another object of the present invention to provide a sealer for a container having an opening that is large enough so that filling liquid into the container and cleaning the container is an easy task.

It is a further object of the present invention to provide a sealer for flexible containers that is durable in extensive out-door activity.

Further, it is another object of the present invention to provide a sealer for flexible containers that is cheap and easy to use.

It is thus provided a sealer for sealing a flexible liquid container, said liquid container having a cavity for receiving liquid and an opening, said sealer comprising:

a hollow cylinder having an open end and a closed end, said cylinder is provided with an elongated slot in said cylinder from the closed end to the open end, said slot meets said open end;
a rod attached to said close end, positioned inside said hollow cylinder and substantially concentric to said hollow cylinder;

wherein in order to sealingly block liquid passage between the cavity and the opening, said hollow cylinder is slidably dressed through said open end and said slot onto a portion of said container, said portion is between the cavity and the opening, said portion is slidably threaded between said hollow cylinder and said rod.

Furthermore, in accordance with another preferred embodiment of the present invention, the length of said sealer is at least as the length of said portion.

Furthermore, in accordance with another preferred embodiment of the present invention, a cap closes said closed end.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod is slightly protruding beyond said open end.

Furthermore, in accordance with another preferred embodiment of the present invention, said flexible container is formed from two films having the majority of their perimeter fused, allowing a portion of the perimeter unfused so as to acts as the opening.

Furthermore, in accordance with another preferred embodiment of the present invention, said slot is slightly wider than twice the accumulative thickness of said two films.

Furthermore, in accordance with another preferred embodiment of the present invention, the distance between the outer diameter of said rod and the inner diameter of said hollow cylinder is slightly larger than the accumulative thickness of said two films so that said two films may be freely threaded between said rod and said hollow cylinder and so that said two films are tightly contiguous.

Furthermore, in accordance with another preferred embodiment of the present invention, one of said two films has an extension that goes beyond the opening

Furthermore, in accordance with another preferred embodiment of the present invention, said extension is provided with a hole.

Furthermore, in accordance with another preferred embodiment of the present invention, said flexible container is made of a material selected from a group of materials such as polyethylene, PVC or polyurethane.

Furthermore, in accordance with another preferred embodiment of the present invention, said flexible container is provided with a liquid dispensing opening.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod has a round cross section.

Finally, in accordance with another preferred embodiment of the present invention, said sealer is made from a rigid polymer, said rigid polymer is selected from a group of materials such as ABS or acetal polypropylene.

It is thus provided also a hydration system comprising:

a flexible container having a cavity for receiving liquid and a opening for filling liquid and cleaning;

5 a liquid dispensing opening positioned on the wallside of said flexible container, said liquid dispensing opening is fluidically communicating with said cavity;

a sealer for sealingly block liquid passage between said cavity and said opening, said sealer comprising:

10 a hollow cylinder having an open end and a closed end, said cylinder is provided with an elongated slot in said cylinder from the closed end to the open end, said slot meets said open end;

a rod attached to said close end, positioned inside said hollow cylinder and substantially concentric to said hollow cylinder;

15 wherein said flexible container has two positions, an open position in which said cavity is fluidically communicating with said opening and a close position in which a portion of said flexible container is positioned between said rod and said hollow cylinder,

whereby in order to attain said close position, said portion of said flexible container is slidably threaded through said open end between 20 said rod and said hollow cylinder so as to contiguously and tightly connect said portion and said sealer, and in order to attain said open position, said sealer is slidably removed from said portion.

Furthermore, in accordance with another preferred embodiment of the present invention, said flexible container is formed from two films of polymeric 25 material having the majority of their perimeter fused, allowing a portion of the perimeter unfused so as to acts as the opening.

Furthermore, in accordance with another preferred embodiment of the present invention, said slot is slightly wider than twice the accumulative thickness of said two films.

30 Furthermore, in accordance with another preferred embodiment of the present invention, the distance between the outer diameter of said rod and the inner diameter of said hollow cylinder is slightly larger than the accumulative thickness of said two films so that said two films may be freely threaded

between, said rod and said hollow cylinder and so that said two films are tightly contiguous.

Furthermore, in accordance with another preferred embodiment of the present invention, the length of said sealer is at least as the length of said
5 portion.

Furthermore, in accordance with another preferred embodiment of the present invention, said rod is slightly protruding beyond said open end.

Finally, in accordance with another preferred embodiment of the present invention, said flexible container is made of a material selected from a group of
10 materials such as polyethylene, PVC or polyurethane.

BRIEF DESCRIPTION OF THE FIGURES

15 Figure 1 illustrates a view of a personal hydration system being filled with water through an opening in accordance with a preferred embodiment of the present invention.

20 Figure 2 illustrates an isometric view of a sealer for personal hydration systems in accordance with a preferred embodiment of the present invention.

25 Figure 3A illustrates the sealer shown in Figure 2 and the personal hydration system shown in Figure 1 during the closing course of the hydration system.

Figure 3B illustrates the personal hydration system shown in Figure 1, fully closed by the sealer for hydration system shown in Figure 2.

DETAILED DESCRIPTION OF THE INVENTION AND THE FIGURES

The unique seal of the present invention is designated to seal a relatively large opening in a flexible container that is a part of a personal hydration system. The seal prevents leakage of liquid from the container, no matter
5 what is the orientation of the container. Therefore, the container may be positioned in any orientation as well as on its side without leakage.

Reference is now made to Figure 1 illustrating a view of a personal hydration system being filled with water through an opening in accordance
10 with a preferred embodiment of the present invention. The container 10 is a flexible and flat container that is made from a polymeric material such as polyurethane, PVC, or polyethylene. Container 10 is made from two films of polymeric material that are fused together at three sides 12 of the container, near its perimeter. The fusion is performed by conventional methods such as
15 ultrasonic high frequency or heat. The fused sides of the films form a cavity that is adapted to receive liquid. At one of the narrower sides of container 10, the perimeter is not fused so that an opening 14 is formed. One of the polymeric films has an extension 16 that facilitates in the opening of opening 14 when the container is filled since the two films forming the container are
20 adjacent to each other. Extension 16 provides also a gripping portion for handling the container. A hole 18 is provided in extension 16. Hole 18 may be used in order to suspend container 10 when it is stored or when the container is being cleaned or dried.

Container 10 is provided with a liquid dispensing opening 20 in one side,
25 close to the bottom of the container. Liquid dispensing opening 20 is designated to be connected to a flexible drinking pipe 22. At the proximal side of drinking pipe 22, a drinking valve 23 is provided. In order to fill container 10 with liquid such as water, opening 14 is oriented at the top of the container and freely opened. Container 10 is suspended with opening 14 wide open so
30 that water 26 coming out from water tap 24 is directed to fill container 10. Water 28 that is filled in container 10 may be drunk from container 10 through flexible drinking pipe 22 and drinking valve 23.

Opening 14 is a large opening relative to the openings that are usually available in such containers so that the container may be filled conveniently

(as shown in Figure 1). Moreover, ice cubes or any other solids or herbs may be inserted also very easily through opening 14. But, when the container is to be cleaned, the advantages of opening 14 are the most significant. A hand with a cleaning cloth may be easily inserted into the container so that there is no need in special cleaning accessories. Moreover, the opening does not have any folds or fused cup's screw so that leftovers from the liquid can not be trapped in the folds and the cleaning is optimal.

After water fills container 10 and it is ready to be used, opening 14 has to be hermetically closed. Reference is now made to Figure 2, illustrating an isometric view of a sealer for personal hydration systems in accordance with a preferred embodiment of the present invention. Sealer 50 comprises a hollow cylinder 52. Cylinder 52 has two ends, the first end is an open end 56 and the second end is closed, preferably by a cap 58. An elongated slot 54 is carved along the side of cylinder 52, slot 54 meets open end 56. In the zone where the slot meets the open end of the cylinder, a broadening of the slot is provided so that the threading of the container into the slot is easier. A concentric and elongated rod 60 is attached substantially at the center of cap 58 and protrudes slightly through open end 56. Sealer 50 is preferably made from a rigid polymeric material such as acetal polypropylene or ABS.

Reference is now made to Figure 3A illustrating the sealer shown in Figure 2 and the personal hydration system shown in Figure 1 during the closing course of the hydration system. Container 10 is folded in a way that extension 16 is wrapped over opening 14 and a fold 62 is formed. Opening 14 is fully on one side of the fold while the liquid receiving cavity is full on the other side of the fold. Fold 62 is threaded into cylinder 52 of sealer 50 so that fold 60 is between the cylinder and rod 60. In order to establish this position, open end 56 of sealer 50 is positioned so that it wraps one side of fold 62, the rod is positioned in the interior of the fold and sealer 50 slidably proceeded towards the other side of the fold. The reason rod 60 protrudes from hollow cylinder 52 is to ease the insertion of the fold between the rod and the cylinder. The extended rod acts as a guide when the fold is threaded inside the cylinder and makes the insertion of the cylinder and the rod onto the fold of the container easier. Sealer 50 can not be removed from the fold unless it slides in an opposite direction to the direction it has been put on since slot 54

is narrower than the diameter of rod 60. Figure 3A shows sealer 50 half way put onto fold 62.

Reference is now made to Figure 3B illustrating the personal hydration system shown in Figure 1, fully closed by the sealer for hydration system shown in Figure 2. Sealer 50 is fully slid onto fold 62 until cap 58 that acts also as a stopper collides into fold 62 and can not proceed. The length of sealer 50 is preferably the same or slightly longer than the length of container 10 in the direction it is folded so that rod 60 slightly protrudes from cylinder 52 and the container's side. When sealer 50 is fully inserted and closes container 10, water 28 from the container can not leak even if the container is oriented up side down, so that the fold is in the bottom of the container.

The container is hermetically sealable if the slot in the hollow cylinder is slightly wider than twice the thickness of the container (the thickness of the container means the accumulative thickness of the two films that form the container). The thickness of the slot has to be optimized so that from one side it will be wide enough so that the folded container may be freely slid through the slot and from the other side, it has to be narrow enough so that water can not pass through the fold. In the same manner, the diameter of the elongated rod has to be adjusted so that the folded container may be freely inserted into the hollow cylinder between the cylinder and the rod. The two films in the fold that are situated between the hollow cylinder and the rod and inside the slot of the cylinder have to be tightly contiguous in order to establish a good sealing characteristic of the sealer. An example for optimized sizes of a container and a corresponding sealer are: for a container having thickness of approximately 0.9 mm (the thickness of the two films), a sealer having a slot of about 3 mm, a rod of about 3 mm in diameter and an inner cylinder diameter of about 11.5 mm will adapt to sealingly block the passage of liquid from the liquid receiving cavity through the fold while at the same time the insertion of the fold into the cylinder is easy.

It is optional to provide another opening on one side of the container. This opening is an opening that resembles an ordinary opening of a container having a fused screw and a corresponding cup. This opening may be used in order to fill some more liquid to the container without having to open the sealer.

It should be clear that the description of the embodiments and attached Figures set forth in this specification serves only for a better understanding of the invention, without limiting its scope as covered by the following Claims.

5 It should also be clear that a person in the art, after reading the present specification could make adjustments or amendments to the attached Figures and above described embodiments that would still be covered by the following Claims.

CLAIMS

1. A sealer for sealing a flexible liquid container, said liquid container having a cavity for receiving liquid and an opening,
5 said sealer comprising:
a hollow cylinder having an open end and a closed end, said cylinder is provided with an elongated slot in said cylinder from the closed end to the open end, said slot meets said open end;
a rod attached to said close end, positioned inside said hollow cylinder
10 and substantially concentric to said hollow cylinder;
wherein in order to sealingly block liquid passage between the cavity and the opening, said hollow cylinder is slidably dressed through said open end and said slot onto a portion of said container, said portion is between the cavity and the opening, said portion is slidably threaded
15 between said hollow cylinder and said rod.
2. The sealer as claimed in Claim 1, wherein the length of said sealer is at least as the length of said portion.
- 20 3. The sealer as claimed in Claim 1, wherein a cap closes said closed end.
4. The sealer as claimed in Claim 1, wherein said rod is slightly protruding beyond said open end.
- 25 5. The sealer as claimed in claim 1, wherein said flexible container is formed from two films having the majority of their perimeter fused, allowing a portion of the perimeter unfused so as to acts as the opening.
- 30 6. The sealer as claimed in Claim 5, wherein said slot is slightly wider than twice the accumulative thickness of said two films.

7. The sealer as claimed in Claim 5, wherein the distance between the outer diameter of said rod and the inner diameter of said hollow cylinder is slightly larger than the accumulative thickness of said two films so that said two films may be freely threaded between said rod and said hollow cylinder and so that said two films are tightly contiguous.
8. The sealer as claimed in Claim 1, wherein one of said two films has an extension that goes beyond the opening.
9. The sealer as claimed in claim 8, wherein said extension is provided with a hole.
10. The sealer as claimed in Claim 1, wherein said flexible container is made of a material selected from a group of materials such as polyethylene, PVC or polyurethane.
11. The sealer as claimed in Claim 1, wherein said flexible container is provided with a liquid dispensing opening.
12. The sealer as claimed in Claim 1, wherein said rod has a round cross section.
13. The sealer as claimed in Claim 1, wherein said sealer is made from a rigid polymer, said rigid polymer is selected from a group of materials such as ABS or acetal polypropylene.
14. A hydration system comprising:
a flexible container having a cavity for receiving liquid and a opening for filling liquid and cleaning;
a liquid dispensing opening positioned on the wallside of said flexible container, said liquid dispensing opening is fluidically communicating with said cavity;

a sealer for sealingly block liquid passage between said cavity and said opening, said sealer comprising:

a hollow cylinder having an open end and a closed end, said cylinder is provided with an elongated slot in said cylinder from the closed end to the open end, said slot meets said open end;

a rod attached to said close end, positioned inside said hollow cylinder and substantially concentric to said hollow cylinder;

wherein said flexible container has two positions, an open position in which said cavity is fluidically communicating with said opening and a close position in which a portion of said flexible container is positioned between said rod and said hollow cylinder,

whereby in order to attain said close position, said portion of said flexible container is slidably threaded through said open end between said rod and said hollow cylinder so as to contiguously and tightly connect said portion and said sealer, and in order to attain said open position, said sealer is slidably removed from said portion.

15. The hydration system as claimed in Claim 14, wherein said flexible container is formed from two films of polymeric material having the majority of their perimeter fused, allowing a portion of the perimeter unfused so as to acts as the opening.

16. The hydration system as claimed in Claim 15, wherein said slot is slightly wider than twice the accumulative thickness of said two films.

17. The hydration system as claimed in Claim 15, wherein the distance between the outer diameter of said rod and the inner diameter of said hollow cylinder is slightly larger than the accumulative thickness of said two films so that said two films may be freely threaded between said rod and said hollow cylinder and so that said two films are tightly contiguous.

18. The hydration system as claimed in Claim 14, wherein the length of said sealer is at least as the length of said portion.

19. The hydration system as claimed in Claim 14, wherein said rod is slightly protruding beyond said open end.
- 5 20. The hydration system as claimed in Claim 14, wherein said flexible container is made of a material selected from a group of materials such as polyethylene, PVC or polyurethane.
21. A sealer for sealing a flexible liquid container, substantially as disclosed
10 in the above specification, Figures and Claims.
22. A hydration system, substantially as disclosed in the above specification, Figures and Claims.

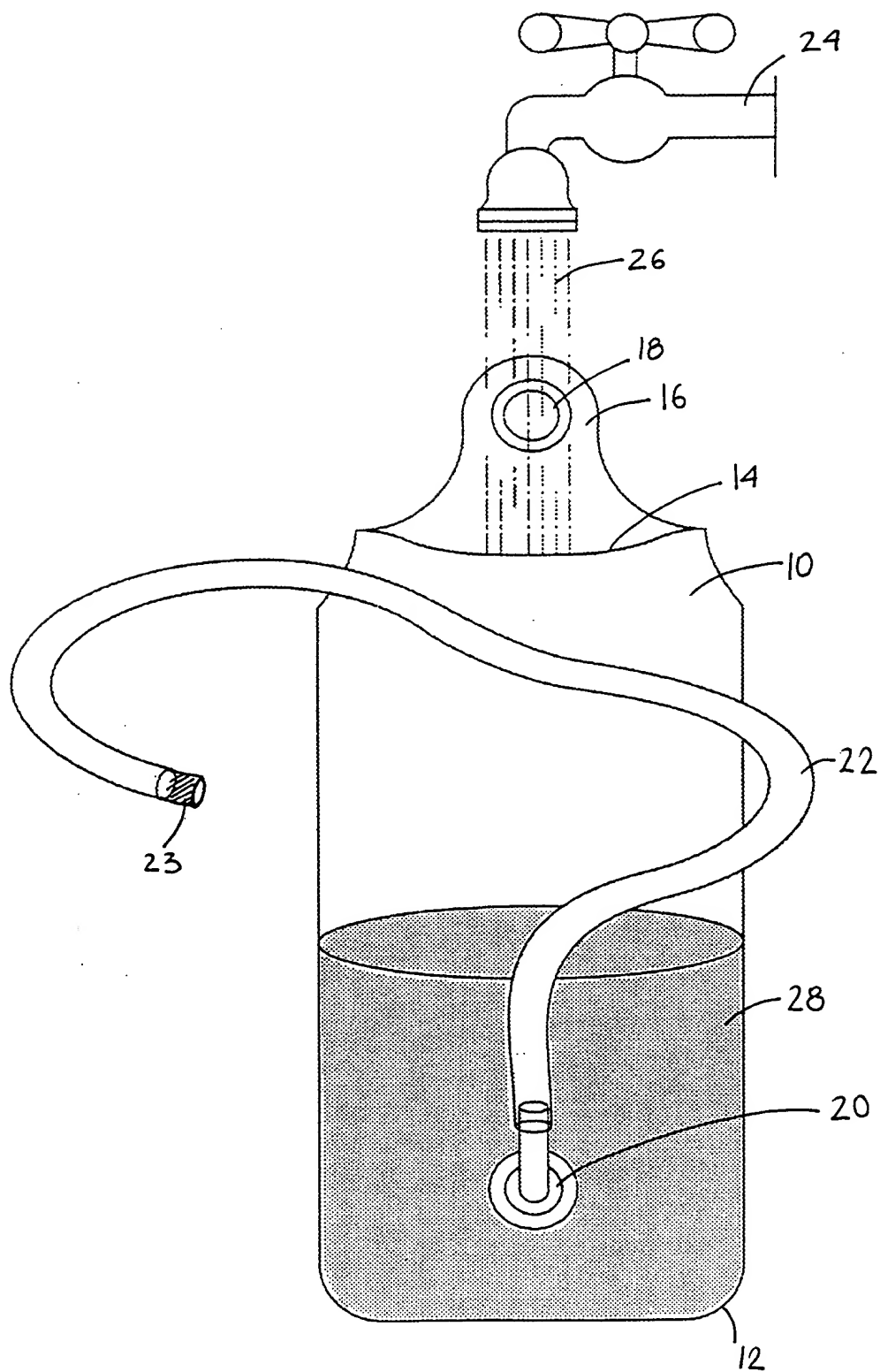


Figure 1